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Effectiveness of Community Health Worker-Led Interventions versus Routine Care on Malaria Prevention in Children under Five: A Narrative Review

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ABSTRACT

Malaria continues to pose a significant threat to the health and survival of children under five, particularly in sub-Saharan Africa, where healthcare access is limited. Community Health Worker (CHW)-led interventions have emerged as an effective strategy to bridge gaps in malaria prevention, offering culturally aligned, community-based care that complements routine facility-based services. This narrative review evaluated the comparative effectiveness of CHW-led interventions versus routine care in preventing malaria among children under five. The article synthesized evidence from peer-reviewed studies and program evaluations to highlight how CHWs improve access to insecticide-treated nets (ITNs), facilitate early detection of febrile illnesses, enhance caregiver education, and foster prompt treatment-seeking behavior. A narrative synthesis methodology was employed, drawing from a wide range of empirical studies and policy documents to evaluate implementation outcomes and contextual relevance. Findings indicated that CHW-led interventions result in higher ITN usage, earlier treatment initiation, and improved caregiver satisfaction compared to routine facility care. Despite these benefits, challenges persist, including variable training quality, limited supervision, logistical constraints, and sustainability issues. The review underscored the need for better integration of CHWs into national health systems, investment in supportive infrastructure, and community engagement to maximize their impact. CHW-led models offer a promising, scalable solution for reducing malaria burden in vulnerable pediatric populations.

Keywords: Community Health Workers (CHWs), Malaria Prevention, Children Under Five, Routine Care, Insecticide-Treated Nets (ITNs).

INTRODUCTION

Malaria remains a leading cause of morbidity and mortality among children under five years, particularly in sub-Saharan Africa and other endemic regions [1–3]. Despite significant strides in malaria control, children in this age group continue to suffer disproportionately due to their underdeveloped immune systems and limited access to timely diagnosis and treatment. The global health community has advocated community-based strategies to bridge existing healthcare delivery gaps, particularly in underserved and remote areas. Among these, the deployment of Community Health Workers (CHWs) has gained considerable attention as a cost-effective and culturally appropriate intervention for delivering malaria prevention services to at-risk populations.

CHWs are typically lay individuals trained to provide basic health services, including health education, malaria screening, distribution of preventive commodities such as insecticide-treated nets (ITNs), and referral for clinical care [4, 5]. Their proximity to the community and cultural alignment enables them to deliver context-specific interventions and foster trust among caregivers of children under five. By contrast, routine facility-based care often faces systemic challenges such as limited human resources, overcrowding, delayed care, and geographical barriers that can limit access to timely malaria prevention and treatment. This review critically examines the effectiveness of CHW-led interventions compared to routine care in preventing malaria among children under five. Drawing from a range of studies across diverse malaria-endemic settings, the narrative synthesizes evidence on how CHWs

enhance service coverage, improve caregiver knowledge, increase ITN usage, and ensure prompt management of febrile illnesses. It further explores challenges associated with CHW models, such as supervision, training variability, and sustainability. The review aims to offer a nuanced understanding of the role CHWs play in the prevention of child malaria, identify gaps in current delivery systems, and propose recommendations for optimizing community-based malaria control strategies. By doing so, it contributes to ongoing efforts to reduce the malaria burden among the most vulnerable populations.

1. The Burden of Malaria in Children Under Five

Children under five remain the most vulnerable demographic in malaria-endemic regions due to several physiological, socio-economic, and healthcare system-related factors [6, 7]. Malaria accounts for a significant proportion of outpatient visits, hospital admissions, and deaths in this age group. Immunologically, young children have not yet developed sufficient resistance to malaria parasites, which increases the severity of infections. Nutritional deficiencies, co-morbidities, and poor caregiver awareness further exacerbate disease outcomes.

Malaria transmission is intensified by environmental conditions such as rainy seasons, poor housing structures, and stagnant water, all of which are prevalent in rural and peri-urban settings [8]. Routine care through formal health facilities is frequently insufficient in reaching every child in these areas. Access barriers such as long distances to clinics, shortage of trained healthcare personnel, cost implications, and lack of transportation impede timely diagnosis and treatment.

As a result, malaria continues to contribute to high rates of anemia, developmental delays, and mortality in children under five. Therefore, innovative and community-based strategies are urgently needed to supplement existing facility-based interventions. CHW-led models, by leveraging community proximity and trust, are uniquely positioned to fill these gaps in preventive and curative care.

2. Community Health Worker-Led Interventions: Structure and Components

Community Health Worker-led interventions are designed to decentralize healthcare services and improve access to essential preventive care [9]. In the context of malaria prevention, CHWs typically perform a variety of functions including:

i. Educating caregivers on malaria prevention methods
ii. Distributing ITNs and monitoring their proper use
iii. Conducting home visits for early detection of febrile episodes
iv. Administering rapid diagnostic tests (RDTs)
v. Providing pre-referral antimalarial treatment
vi. Encouraging prompt referral to health facilities for complicated cases

These interventions are usually embedded within integrated community case management (iCCM) frameworks supported by national malaria control programs or non-governmental health initiatives. CHWs undergo structured training programs that emphasize symptom recognition, diagnostic accuracy, record-keeping, and effective communication.

Unlike routine care, which often requires the caregiver to seek services at a distant health facility, CHW-led interventions bring preventive services to the doorsteps of households. This proximity reduces the time to care, increases caregiver compliance, and facilitates consistent health education. Additionally, CHWs often collaborate with local leaders, thus embedding their activities within existing community structures for improved uptake.

3. Comparative Effectiveness: CHW-Led Interventions vs. Routine Care

Numerous field-based studies and program evaluations have demonstrated that CHW-led interventions can be more effective than routine facility-based care in reducing malaria incidence among children under five [10]. In areas where CHWs distribute ITNs and conduct regular household follow-ups, ITN usage rates have been observed to be significantly higher compared to areas relying solely on routine distribution through clinics.

Furthermore, CHWs contribute to earlier diagnosis and treatment initiation [11]. In many settings, the time from onset of fever to administration of antimalarial therapy is markedly shorter when CHWs are involved, thus reducing the likelihood of complications such as severe malaria and anemia. By contrast, routine care often suffers from delays due to long queues, limited clinic hours, and shortage of diagnostic supplies.

Additionally, CHWs are more likely to educate caregivers on environmental control measures such as eliminating mosquito breeding sites and ensuring appropriate bed net maintenance [12, 13]. Routine care often lacks the capacity for such a personalized education due to staff constraints and time limitations.

Importantly, CHW-led models have been associated with higher caregiver satisfaction and trust in the health system. These qualitative dimensions, though difficult to measure quantitatively, are critical in ensuring sustained behavior change in malaria prevention practices.

4. Challenges and Limitations of CHW-Led Interventions

Despite their demonstrated potential, CHW-led interventions are not without challenges. One of the foremost concerns is the variability in training quality and content [14]. Inconsistencies in training duration, supervision frequency, and assessment methods can affect the accuracy of malaria diagnosis and the appropriateness of referral decisions [15, 16].

Another challenge lies in CHW motivation and retention [17]. Many CHWs operate on a volunteer basis or receive minimal stipends, leading to high attrition rates. This jeopardizes continuity of care and undermines community confidence in the program. Additionally, logistical constraints such as stock-outs of RDTs and antimalarial drugs can limit the effectiveness of CHWs even when they are well trained and motivated.

Supervision and data management also pose critical limitations. Effective CHW programs require ongoing monitoring and evaluation to ensure quality control, yet supervisory structures are often weak due to budgetary constraints or lack of trained personnel at district health offices.

Furthermore, while CHWs are adept at managing uncomplicated malaria cases and providing preventive services, they are not equipped to handle complicated cases or comorbidities [18, 19]. As such, their role must be clearly defined within the broader healthcare system to avoid the risk of misdiagnosis or treatment delays.

5. Integration and Sustainability of CHW Programs

For CHW-led malaria prevention programs to be effective and sustainable, integration into national health systems is essential. This includes formal recognition of CHWs, incorporation into national health workforce planning, and inclusion in malaria surveillance systems. Providing CHWs with clear career pathways, adequate remuneration, and opportunities for continuous professional development can significantly enhance program sustainability.

Furthermore, technology can play a transformative role in strengthening CHW interventions. Mobile health (mHealth) platforms can facilitate real-time data reporting, enable remote supervision, and support diagnostic accuracy through decision-support tools [20, 21].

Community engagement is also vital. When CHWs are selected by and accountable to their communities, they are more likely to be accepted and supported. This participatory approach enhances program ownership and increases the likelihood of sustained behavior change at the household level.

Finally, multi-sectoral collaboration involving education, sanitation, and housing authorities can create a more enabling environment for malaria prevention. CHWs can act as liaisons across sectors, reinforcing the need for integrated approaches to disease control.

CONCLUSION

Community Health Worker-led interventions represent a promising and contextually appropriate strategy for enhancing malaria prevention in children under five, particularly in resource-limited settings. Compared to routine care, CHW-led models offer greater accessibility, improved early detection, higher ITN usage, and enhanced caregiver engagement. Their proximity to the community, coupled with cultural and linguistic alignment, makes them uniquely positioned to deliver effective and timely malaria prevention services. However, the success of these interventions hinges on addressing challenges related to training quality, supervision, motivation, and supply chain reliability. For CHW programs to reach their full potential, they must be institutionally supported, adequately resourced, and effectively integrated into national health systems. Investment in digital tools, community participation, and intersectoral coordination will further bolster their impact. As malaria remains a significant threat to child health, especially in endemic regions, the strategic deployment of CHWs offers a viable pathway to reducing disease burden and improving health equity. Continued research and policy support are needed to refine and scale up these interventions, ensuring that every child, regardless of geography or socioeconomic status, has access to lifesaving malaria prevention services.

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